

What is claimed is:

- 1) An optical fiber coating comprising:  
a photo-polymerizable composition which comprises a non-thiol functional adhesion promoter and  
less than about 0.5 pph of a strength additive containing a thiol functional group.
- 2) The coating according to claim 1 wherein in said strength additive further comprise an organic strength additive and includes at least one element from the group of elements consisting of C, H, N, O, Si, P, F, Cl, Br, I, Ti, Zr, S and mixtures thereof, in addition to an S element in said thiol functional group.
- 3) The coating according to claim 1 wherein said strength additive comprises an alkyl thiol compound.
- 4) The coating according to claim 3 wherein said alkyl thiol comprises at least one compound selected from the following group of compounds consisting of methane thiol, ethane thiol, hexane thiol, dodecane thiol, octadecane thiol, a cysteine derivative, a multi-functional thiol, thiol silane, thiol-functional polysulfides, and mixtures thereof.
- 5) The coating according to claim 1 wherein said strength additive comprises at least one compound selected from the group of compounds consisting of N-(*tert* butoxy carbonyl)-L-cysteine methyl ester, pentaerythritol tetrakis (3-mercaptopropionate), 3-mercaptopropyl trimethoxy silane, 3-mercaptopropyl triethoxy silane, dodecylmercaptan, and mixtures thereof.
- 6) The coating according to claim 1 wherein said concentration of said strength additive comprises up to about 0.3 pph.

- 7) The coating according to claim 1 wherein said concentration of said strength additive comprises up to about 0.1 pph.
- 8) The coating according to claim 1 wherein said strength additive comprises 3-mercaptopropyltrimethoxy silane.
- 9) The coating according to claim 1 wherein said strength additive comprises tert-dodecylmercaptan.
- 10) The coating according to claim 1 wherein said strength additive comprises pentaerythritol tetrakis (3-mercaptopropionate).
- 11) A coated optical fiber comprising:
  - an optical fiber having a core surrounded by a cladding and
  - at least one photo-polymerizable composition applied to said cladding, said composition comprising a non-thiol functional adhesion promoter and
  - less than about 0.5 pph of a strength additive containing a thiol functional group.
- 12) The coated optical fiber according to claim 11, wherein said strength additive further comprises an organic strength additive and includes at least about one element from the group of elements consisting of C, H, N, O, Si, P, F, Cl, Br, I, Ti, Zr, S and mixtures thereof, in addition to an S element in said thiol functional group.
- 13) The coated optical fiber according to claim 11, wherein said strength additive comprises an alkyl thiol.
- 14) The coated optical fiber according to claim 13, wherein said alkyl thiol comprises at least one compound selected from the following group of compounds consisting of methane thiol, ethane thiol, hexane thiol, dodecane thiol, octadecane thiol, a cysteine derivative, a multi-functional thiol, thiol silane, thiol-functional polysulfides, and mixtures thereof.

- 15) The coated optical fiber according to claim 11 wherein said strength additive comprises at least one compound selected from the group of compounds consisting of N-(*tert*-butoxy carbonyl)-L-cysteine methyl ester, pentaerythritol tetrakis (3-mercaptopropionate), 3-mercaptopropyl-trimethoxysilane, 3-mercaptopropyl triethoxy silane, dodecylmercaptan, and mixtures thereof.
- 16) The coated optical fiber according to claim 11 wherein said concentration of said strength additive comprises up to about 0.3 pph.
- 17) The coated optical fiber according to claim 11 wherein said strength additive comprise 3-mercaptopropyltrimethoxy silane.
- 18) The coated optical fiber according to claim 11 wherein said strength additive comprises *tert*-dodecylmercaptan.
- 19) The coated optical fiber according to claim 11 wherein said strength additive comprises pentaerythritol tetrakis (3-mercaptopropionate).
- 20) A method of making an optical fiber comprising:
  - drawing an optical fiber from a sintered preform and
  - coating the fiber with an optical fiber coating comprising no more than about 12 pph of a non-thiol functional adhesion promoter and less than about 0.5 pph of a strength additive containing a thiol functional group.
- 21) The method according to claim 20 wherein the coating has a thickness of at least about 20 microns and is capable of being cured to at least about 70% at an average rate of at least about 180 % /second.
- 22) The coating according to claim 1 wherein a concentration of the said adhesion promoter comprises no more than about 12 pph.

- 23) The coated optical fiber according to claim 11 wherein a concentration of the said adhesion promoter comprises no more than about 12 pph.
- 24) An optical fiber coating comprising:
  - a photo-polymerizable composition which comprises an adhesion promoter, said adhesion promoter includes at least one compound from the group of compounds consisting of a silane, a titanate, a zirconate, and a mixture thereof; and
  - a non-silicon containing strength additive containing at least about one thiol functional group.
- 25) The coating according to claim 24 wherein said adhesion promoter comprises a compound substantially devoid of a thiol functional group.
- 26) The coating according to claim 24 wherein said strength comprises more than about one thiol functional group.
- 27) The coating according to claim 24 wherein said strength additive comprises pentaerythritol tetrakis (3-mercaptopropionate).
- 28) An optical fiber coating comprising:
  - a photo-polymerizable composition which comprises an adhesion promoter, said adhesion promoter includes at least one compound from the group of compounds consisting of a silane, a titanate, a zirconate, and a mixture thereof; and a strength additive containing at least about one halide functional group.
- 29) The coating according to claim 28 wherein said adhesion promoter comprises a compound substantially devoid of a thiol functional group.
- 30) The coating according to claim 28 wherein said strength additive comprises a non-silicon containing compound.

- 31) The coating according to claim 28 wherein said strength additive comprises at least one alkyl-halide compound.
- 32) The coating according to claim 28 wherein said strength additive comprises chloro-octane.
- 33) The coating according to claim 28 wherein said strength additive comprises at least one of a halo-alkyl silane compound, a haloalkyl-alkoxysilane, a haloaryl-alkoxysilane, and combinations thereof.
- 34) The coating according to claim 28 wherein strength additive comprises at least one compound selected from the following group of compounds consisting of chloro-propyltrimethoxy silane and chloro-propyltriethoxy silane
- 35) A coated optical fiber comprising:
  - an optical fiber having a core surrounded by a cladding and
  - a photo-polymerizable composition, applied to said cladding, said composition comprises an adhesion promoter, said adhesion promoter includes at least one compound from the group of compounds consisting of a silane, a titanate, a zirconate, and a mixture thereof; and
  - a non-silicon containing strength additive containing at least about one thiol functional group.
- 36) The coated optical fiber according to claim 35 wherein said adhesion promoter comprises a compound substantially devoid of a thiol functional group.
- 37) The coated fiber according to claim 35 wherein said strength additive comprises more than about one thiol functional group.
- 38) The coating according to claim 35 wherein said strength additive comprises pentaerythritol tetrakis (3-mercaptopropionate).

- 39) A coated optical fiber comprising:
- an optical fiber having a core surrounded by a cladding and  
a photo-polymerizable composition, applied to said cladding, said composition  
comprises an adhesion promoter, said adhesion promoter includes at least one  
compound from the group of compounds consisting of a silane, a titanate, a zirconate,  
and a mixture thereof; and  
a strength additive containing at least about one halide functional group.
- 40) The coated fiber according to claim 39 wherein said strength additive comprises a  
non-silicon containing compound.
- 41) The coated fiber according to claim 39 wherein said strength additive comprises at  
least one alkyl-halide.
- 42) The coated fiber according to claim 39 wherein said strength additive comprises  
chloro-octane.
- 43) The coated fiber according to claim 39 wherein said strength additive comprises at  
least one of a halo-alkyl silane compound, a haloalkyl-alkoxysilane, a haloaryl-  
alkoxysilane, and combinations thereof.
- 44) The coated fiber according to claim 39 wherein strength additive comprises at least  
one compound selected from the following group of compounds consisting of chloro-  
propyltrimethoxy silane and chloro-propyltriethoxy silane.
- 45) The coating according to claim 1 wherein said adhesion promoter includes at least one  
compound from the group of compounds consisting of a silane, a titanate, a zirconate,  
and mixtures thereof.

- 46) The coating according to claim 1 wherein said adhesion promoter comprises a titanate containing compound.
- 47) The coating according to claim 1 wherein said adhesion promoter comprises a zirconate containing compound.
- 48) The coating according to claim 1 wherein said adhesion promoter comprises a silane containing compound.
- 49) The optical fiber according to claim 11 wherein said adhesion promoter includes at least one compound from the group of compounds consisting of a silane, a titanate, a zirconate, and mixtures thereof.
- 50) The optical fiber according to claim 11 wherein said adhesion promoter comprises a titanate containing compound.
- 51) The optical fiber according to claim 11 wherein said adhesion promoter comprises a zirconate containing compound.
- 52) The optical fiber according to claim 11 wherein said adhesion promoter comprises a silane containing compound.
- 53) The coating according to claim 24 wherein said adhesion promoter comprises a titanate containing compound.
- 54) The coating according to claim 24 wherein said adhesion promoter comprises a zirconate containing compound.
- 55) The coating according to claim 24 wherein said adhesion promoter comprises a silane containing compound.
- 56) The fiber according to claim 28 wherein said adhesion promoter comprises a titanate containing compound.

- 57) The fiber according to claim 28 wherein said adhesion promoter comprises a zirconate containing compound.
- 58) The fiber according to claim 28 wherein said adhesion promoter comprises a silane containing compound.
- 59) The coating according to claim 35 wherein said adhesion promoter comprises a titanate containing compound.
- 60) The coating according to claim 35 wherein said adhesion promoter comprises a zirconate containing compound.
- 61) The coating according to claim 35 wherein said adhesion promoter comprises a silane containing compound.
- 62) The fiber according to claim 39 wherein said adhesion promoter comprises a titanate containing compound.
- 63) The fiber according to claim 39 wherein said adhesion promoter comprises a zirconate containing compound.
- 64) The fiber according to claim 39 wherein said adhesion promoter comprises a silane containing compound.
- 65) A method of making an optical fiber comprising:  
drawing an optical fiber from a sintered preform and  
coating the fiber with an optical fiber coating comprising an adhesion promoter, said adhesion promoter includes at least one compound from the group of compounds consisting of a silane, a titanate, a zirconate, and a mixture thereof; and  
a strength additive containing at least about one halide functional group.

- 66) A method of making an optical fiber comprising:  
drawing an optical fiber from a sintered preform and  
coating the fiber with an optical fiber coating comprising an adhesion  
promoter, said adhesion promoter includes at least one compound from the group of  
compounds consisting of a silane, a titanate, a zirconate, and a mixture thereof; and  
a non-silicon containing strength additive containing at least about one thiol  
functional group.
- 67) An optical fiber coating comprising:  
a polymerizable composition which comprises an adhesion promoter, said  
adhesion promoter including at least one compound selected from the group of  
compounds consisting of silanes, titanates, zirconates, and mixtures thereof; and  
a strength additive selected from the group consisting of compounds containing at  
least one halide functional group, at least one thiol functional group, and mixtures  
thereof,  
wherein a difference in Young's modulus of the coating when cured and of a  
similar cured coating compound without said strength additive is no more than about  
12%.
- 68) The optical fiber coating according to claim 67 wherein said difference is no more  
than about 10%.
- 69) The optical fiber coating according to claim 67 wherein said strength additive  
comprising a thiol functional group comprises a compound substantially devoid of  
silicon.
- 70) An optical fiber coating comprising:  
a polymerizable composition which comprises an adhesion promoter, said  
adhesion promoter including at least one compound selected from the group of  
compounds consisting of silanes, titanates, zirconates, and mixtures thereof; and  
a strength additive selected from the group consisting of compounds containing at  
least one halide functional group, at least one thiol functional group, and mixtures

thereof, wherein a difference in relative cure speed of the coating when cured and of a similar cured coating compound without said strength additive is no more than about 10%.

- 71) The optical fiber coating according to claim 70 wherein said difference comprises less than about 5%.
- 72) The optical fiber according to claim 11 wherein said optical fiber has an effective area greater than about  $60 \mu\text{m}^2$ .
- 73) The optical fiber according to claim 35 wherein said optical fiber has an effective area greater than about  $60 \mu\text{m}^2$ .
- 74) The optical fiber according to claim 39 wherein said optical fiber has an effective area greater than about  $60 \mu\text{m}^2$ .
- 75) An optical fiber coating comprising:  
a photo-polymerizable composition which comprises an adhesion promoter, said adhesion promoter includes at least one compound from the group of compounds consisting of a silane, a titanate, a zirconate, and a mixture thereof; and  
a strength additive having the general formula RX wherein R comprises an organic group and X comprises a group capable of participating in a nucleophilic addition or substitution reaction.
- 76) The composition according to claim 75 wherein said X comprises Cl, Br, F, I and combinations thereof.
- 77) A coated optical fiber comprising an optical fiber and a coating in accordance with claim 75.
- 78) An optical fiber coating composition comprising  
at least one adhesion promoter and

at least one water scavenger.

- 79) The composition according to claim 78 wherein said adhesion promoter comprises a silane containing compound.
- 80) The composition according to claim 78 wherein said water scavenger comprises at least one from the group comprising a thiol-functional silane compound, an amino-silane compound, and combinations thereof.
- 81) The composition according to claim 78 wherein said water scavenger comprises a silane containing compound.

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